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E-business Guide

Executive Summary

More than just a technology initiative, e-business is a strategic alignment of business processes with business partners. E-business is a new solution for an old problem – the need for information systems to exchange critical information in real time. It is no longer possible for large enterprises to succeed in their mission without transforming their way of business to the information age and considering the benefits that diverse e-business solutions can deliver. In fact, the President's Management Agenda includes an initiative to "advance E-government strategy by supporting projects that offer performance gains across agency boundaries." [1] Even after the hype of e-business in recent years, the integration of business processes, internally and externally, remains a priority for enterprises around the world. In a recent IBM survey of CIOs, the top two types of strategic software projects for 2004 are application integration and e-business.

The advancement of information systems has expanded the type of transactions that organizations such as the Army process electronically, both internally and externally. This has created a myriad of e-business models (e.g. business-to-government, government-to-government, and application-to-application), which have blurred the definition of an enterprise. Once the boundaries of an enterprise are defined, relationships with business partners can be categorized into e-business models. For instance, instead of considering each domain within the Army to be an enterprise, consider the Army as a whole to be an enterprise. Integration extending beyond the enterprise boundaries with external business partners takes the form of *exchanging* information, whereas integration within the boundaries of the enterprise takes the form of *sharing* information.

The objectives of e-business are to reduce costs and improve efficiency, effectiveness, responsiveness, and customer satisfaction. Driving the attainment of these objectives are factors such as the availability of the Internet, automation of processes, and access to information. Technology support for information, data, applications, and infrastructure are requirements of e-business.

As e-business evolves, it is growing beyond basic point-to-point trading. "It is extending to e-collaboration, the need to manage complex business processes and rich relationships between entities. [E-business addresses] the need for integration that begins within the enterprise but spans well beyond the enterprise walls to reach partners, suppliers, and customers." [2]

While the topic of e-business is rooted in technology, many of the solutions and concepts are neither complex nor technical. Readers of this document do not need a technical aptitude to comprehend the message. In addition to providing an overview of e-business concepts, this document will help readers understand how it can improve an enterprise's integration efforts.

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A. Introduction

More than 40 years ago, the military recognized the importance of doing business electronically. In 1962 the military standards known as MILS (Military Standard Logistics Systems) were developed to provide procedures for communicating requirements, moving materiel, and performing other tasks that ensure the continuing operation of the Department of Defense (DoD) logistics system. These standards laid the foundation for the military to interact with suppliers electronically with approximately 11 million MILS transactions per day. For instance, all of the Army's supply of black powder is purchased electronically from the supplier using MILS.

Over recent years, the concept of performing business electronically has gained acceptance across multiple industries because of its ability to support business processes in an efficient and effective manner. The black powder example displays this capability, and more specifically, how the Army has begun a transformation to integrate its business processes, both internally and externally. Historically, technology integration means connecting newer enterprise information systems with older, legacy data. The definition has evolved to encompass the "cohesive integration of both data and business logic, including collaboration with partners, suppliers, and customers in an intelligent value chain of products and services. Companies need to be able to link and manage business processes together." [2]

Before looking at e-business and the types of business performed electronically, it is necessary to understand the concept of an enterprise. An enterprise is an organizational entity consisting of people, processes, and technology that uses information networks to interact with employees, suppliers, or customers. Enterprises can engage in intra-enterprise e-business by integrating internal data and processes, or inter-enterprise e-business by linking data and business processes with those of external partners. Although these two categories have different requirements for success, there are fundamentals of e-commerce that apply to both. Possessing an understanding of e-business fundamentals is beneficial to enabling enterprise integration and business transformation because e-business is integral to the future of DoD.

"As enterprises proceed through enterprise integration and business transformation, they should ask themselves the following questions:

- Is our e-commerce deployment isolated from other [operations] or procurement channels?
- Is our current e-commerce system custom built and difficult to upgrade? [i.e., proprietary, not using commercial standards]
- Is our current e-commerce system built on a vendor platform over 4 years old? [4 years identified by Gartner but timing depends on specific environment]
- Do we still require manual intervention to process orders or other transactions?
- Are we seeking ways to increase business partner loyalty [supplier incentives]?" [3]

Answers to these questions will indicate how quickly DoD, as an enterprise, needs to increase its e-business investments. Although answers to these questions may raise red flags, it is important to note that they do not necessarily identify next steps. Careful strategic analysis, business process analysis, and economic analysis are required before charging ahead with a solution.

E-business has provided the global community with a relatively inexpensive channel (i.e., Internet) between business partners (employees, suppliers, customers). "The two real technical elements to successful e-business are *interface* and *integration*. Most of the emphasis in making e-business work has been on the interface component." [2] Until recently, the need for integration has not been pushed to the forefront for the achievement of successful e-business. In addition to discussing the *interface* component of transmitting transactions between systems over the Internet, this document discusses the *integration* component of incorporating the back-end processing of those transactions. Integration is becoming more than just an extension of e-business, but actually a necessary element for success.

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Although e-business and e-commerce are frequently used interchangeably, a distinction can be drawn between the two. For purposes of this document, e-commerce is simply the execution of business transactions over computer networks. E-business extends the concept of e-commerce to include collaborative business processes among business partners linked by a strategic vision.

Purpose & Scope

This document intends to provide fundamental information regarding e-business concepts, including technology and process integration considerations. This document also discusses the considerations regarding sharing and exchanging data. This document includes the technology, processes, and integration surrounding e-business models. E-business concepts relating to the public sector, and more specifically to DoD, are the primary focus.

Glossary of Terms

It is important to establish an understanding of e-business terms due to the lack of standardized definitions in the industry. This document attempts to use the most widely adopted meanings. Refer to **Appendix A** for the Glossary of Terms.

References

Refer to **Appendix E** for document references shown in brackets [].

Misconceptions Regarding E-business

Enterprises have been doing business in the industrial age for so long that quickly shifting to the information age is not a simple endeavor. While the industrial age is characterized by the use of machinery and factories, the information age is characterized by the use of computers and networks for gathering, manipulating, storing, and retrieving of information. There is a common misconception that converting mature manual commerce methods to computer-based commerce methods can be done without a gradual evolution. Organizational inertia is inherent in large enterprises, partly due to the numerous years spent fine tuning the way business is conducted. Proper planning and analysis must be performed to ensure that manual processes transition to electronic processes appropriately.¹

Another misconception in e-business is that technology is the answer. Instead, sound business strategy that uses technology as an enabler is the answer. Far too often decision makers latch on to an answer before they even know the questions. Typically when this happens, an electronic commerce solution may be implemented only to find out that the solution does not provide the efficiency or effectiveness expected by the end user.¹ The capabilities needed must be the starting point.

With the emergence of the information age, the commodity that is 'transmitted' between business partners is data (read: information), as opposed to products and money in the industrial age. So at the granular level of e-business, the element that is being passed around is data. Given that, an easy mistake to make is to think that 'data is king'. However, data is not king, it is merely a by-product of a business process, and a business process is a by-product of a business strategy. Although data is an essential element in e-business, the business strategies and business processes are most critical to success.¹

¹ Paul L. Derby, Principal Enterprise Consultant, Binary Consulting Inc., supporting Army Architecture Integration Cell, Army Business Enterprise Team, CIO/G6, personal interview, 8 July 2004.

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B. Concepts in E-Commerce

Objective of E-business

The ultimate objectives of e-business are to reduce costs and improve efficiency, effectiveness, responsiveness, and customer satisfaction. The fundamentals of performing commerce electronically contribute to achieving these objectives. For instance, overall expenses can be reduced by lowering transaction costs and operating efficiencies can be gained by streamlining business processes. A simple example from the private sector where e-business lowers transaction costs can be seen in the banking industry. "In a commercial bank a basic over-the-counter transaction costs \$1.07 to process; over the Internet, the same transaction costs about 1 penny". [4] Relating that scenario to DoD's food supply chain with \$2.7 billion in orders (fiscal year '03), transaction costs will be significantly reduced by transitioning to a consolidated electronic system. The Common Food Management System (CFMS) is in the process of being deployed in DoD to provide a Web-based ordering and invoicing system for food supplies (i.e., Class 1) linked directly to suppliers.

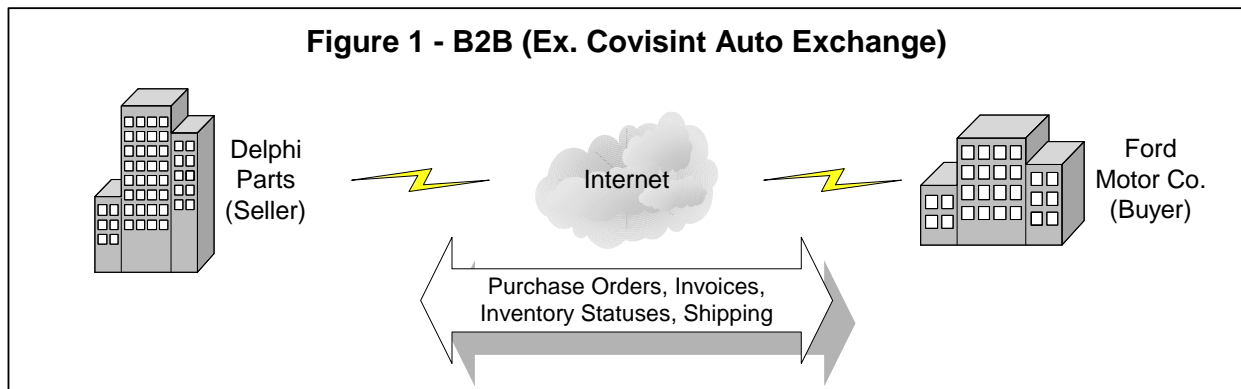
Increased collaboration and coordination is also an objective of e-business. New technologies such as Web services and standardized Internet protocols have transformed the way people collaborate to exchange information and develop solutions. Further, these technology capabilities are available around the clock as opposed to the "business hours" of the industrial age. New technologies have transformed the way enterprises interact with employees, suppliers, and customers. With an enterprise such as the Army requiring interaction and data exchange across all time zones, the ability to conduct business regardless of location, time of day, or personnel availability has obvious advantages.

E-business Models

The numerous e-business models in use today are classified based on the nature of the transactions. See **Figure 1** through **Figure 6** for a pictorial representation of the noteworthy e-business models. Note that although not all of the e-business models are discussed in detail in this section, they are all defined in the Glossary of Terms (see **Appendix A**).

Business to Business (B2B) Model

B2B is an e-business model where the buyers and sellers are businesses (see **Figure 1**). B2B typically focuses on supporting supply chain processes. B2B typically involves stable and mature relationships among business partners. However, one benefit of e-business is that it fosters new business partner relationships through the relative ease of access to electronic business channels. An example of the B2B model was deployed by the Covisint automobile parts broker that supports procurement and fulfillment for automobile manufacturers and their suppliers. A supplier of auto parts, like Delphi, may sell its parts through the Covisint portal to Ford Motor Company to be used in the manufacturing process.

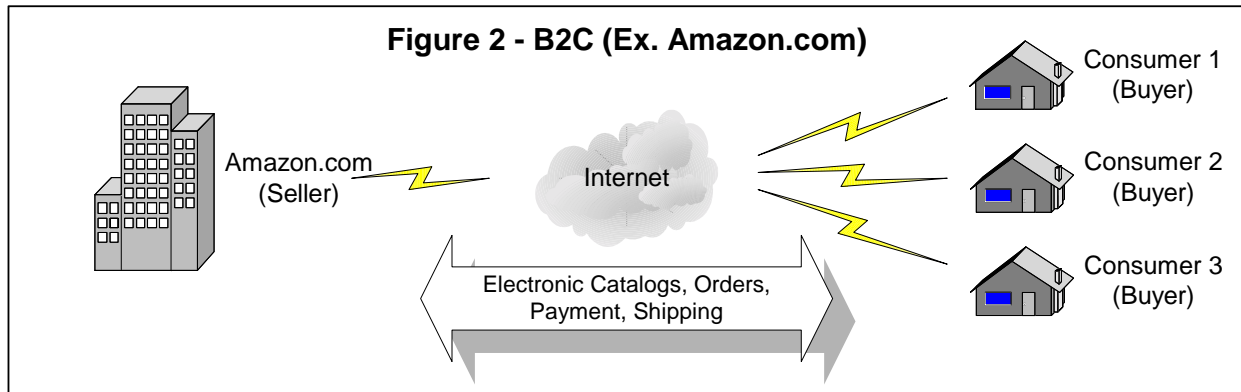


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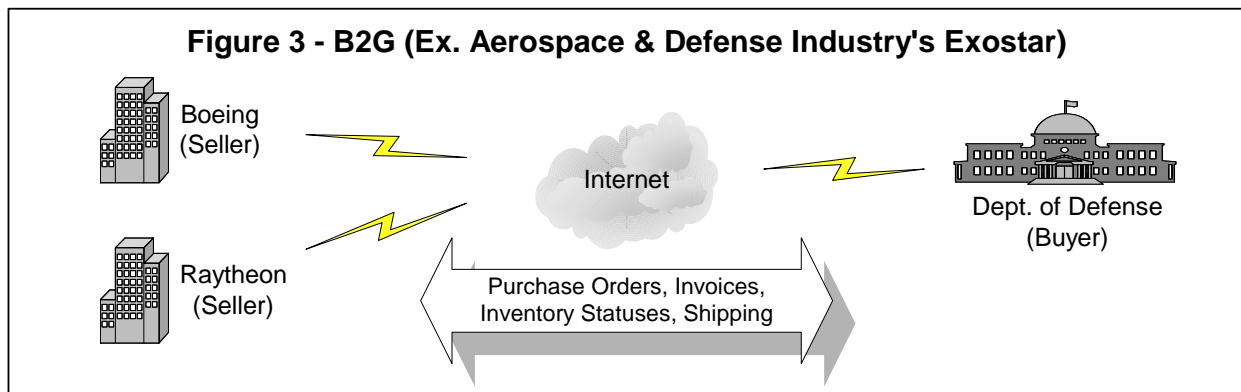
Business to Consumer (B2C) Model

B2C is an e-business model where consumers access a merchant's Web site for the purpose of buying a product or requesting a service (see **Figure 2**). This includes pure-play e-tailers (Internet retailers, e.g. Amazon.com) that strictly conduct business over the Internet and click-and-mortar businesses that have physical stores as well as Internet stores (e.g. Barnes and Noble). The business rules and pricing are generally set by the seller versus the consumer-to-consumer model where the buyer establishes the price they will pay (e.g. eBay.com).



Business to Government (B2G) Model

B2G (see **Figure 3**) is analogous to B2B, with some key distinctions. Many of the components of B2B also apply to B2G (i.e. procurement, payment, collection, and fulfillment). "The key distinction, however, is that B2G e-commerce is governed not only by marketplace dynamics of logistics, supply and demand, and other factors, but equally as much by a myriad of rules and regulations that have long applied to government procurement." [5] For instance, most governmental organizations establish contractual relationships which prohibit purchases outside relatively strict boundaries. The Federal Acquisition Regulation (FAR) sets policies and procedures for acquisition by all executive agencies. An example of the B2G model is implemented through the aerospace and defense industry's Exostar solution that provides a portal to automate aspects of the procurement and logistics functions between government agencies and the industry's network of suppliers. While Exostar is an example of B2G, it also supports commerce between businesses, which also fulfills the B2B model.



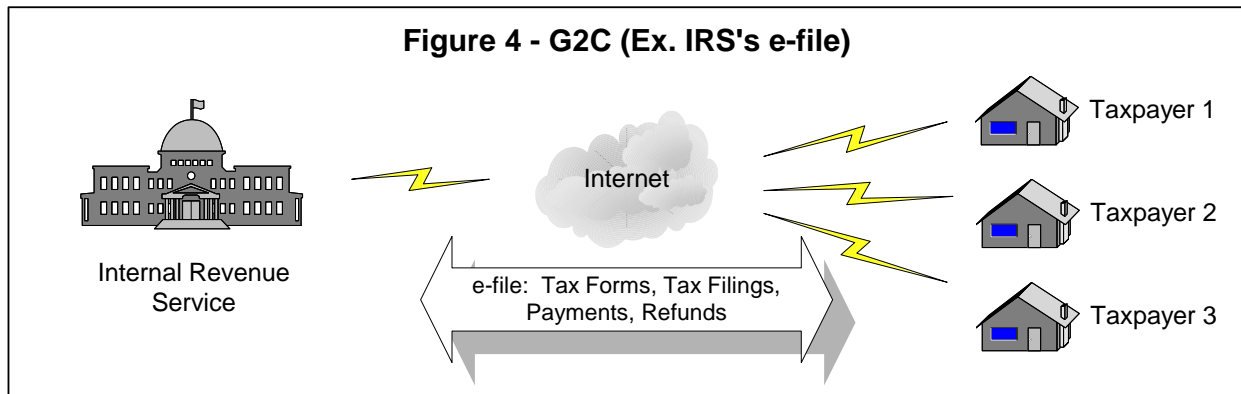
Government to Citizen (G2C) Model

G2C is an e-business model in which the government provides services to citizens electronically (e.g. forms, payments) (see **Figure 4**). In support of the President's Management Agenda, the E-Government

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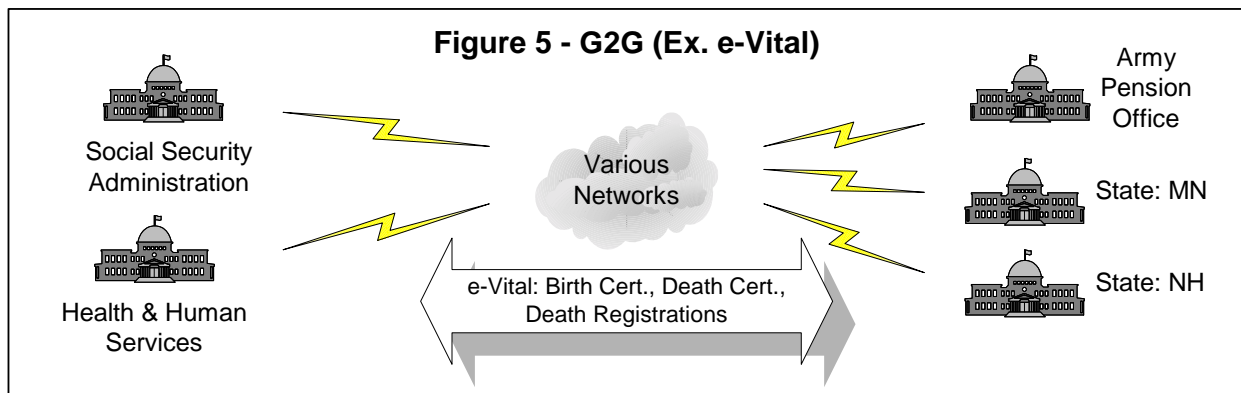
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Strategy document states “citizens should be able to find what they need quickly and easily, and access information in minutes or seconds, instead of days or hours.” [6] The trend in G2C is to enable government services using the Internet for actual commerce, such as tax and license payments, instead of just providing static information. For instance, the IRS has deployed the G2C model through its Web based tax filing system that allows taxpayers the ability to submit their tax forms electronically.



Government to Government (G2G) Model

G2G is an e-business model within or between government organizations that use the Internet or other networks as a transport mechanism for data (see **Figure 5**). Through the e-Vital initiative², a variety of government agencies have collaborated to deploy a G2G solution to report deaths electronically. State agencies submit birth and death certificates electronically; the Social Security Administration maintains the records and provides them to other government organizations such as the Army Pension Office.



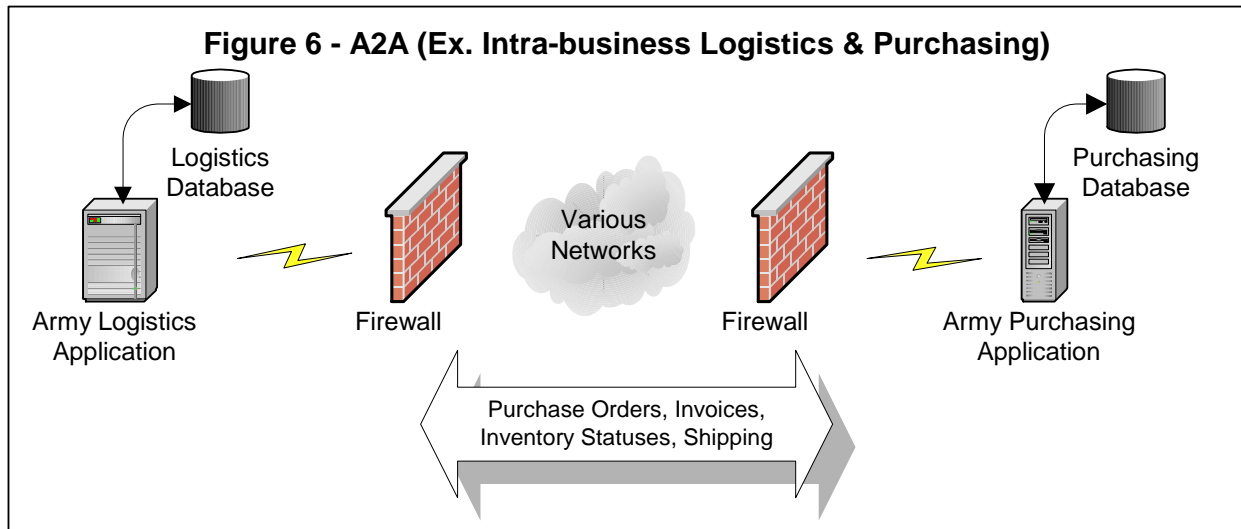
Application to Application (A2A) Model

A2A is not actually considered an e-business model in the context of this document, although it possesses characteristics similar to those of the B2B model, it is essentially a point-to-point interface (see **Figure 6**). The key distinction is that the A2A model involves interactions within a single enterprise between its applications, whereas B2B involves interactions between multiple enterprises. Traditional A2A is transitioning from point-to-point interfaces to the more advanced enterprise application integration (EAI) architecture because of its hub-and-spoke approach. Note that since A2A involves a single enterprise, the diagram displays the hardware level instead of the enterprise level.

² e-Vital is one of the President's E-Government initiatives supported by the President's Management Agenda [1]. For more information see <<http://www.whitehouse.gov/omb/egov/gtog/evital.htm>>.

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Questions to address when analyzing e-business models [7]:

- Transaction Services – What one-way and two-way transactions need to be supported and by whom?
- Data Ownership – Where and how to provide the desired business services? Who is responsible for validating and updating data?
- Interoperable Infrastructure – What level of infrastructure or architecture is required for an enterprise to provide benefits to stakeholders? What interoperability is required for new and legacy data sources?
- Security, Privacy and Data Sharing – Enterprises must be guaranteed that their data is protected while being able to seamlessly obtain the real-time status of their transactions. Enterprises pursuing e-business should strive for seamless data sharing across the enterprise, eliminating stovepipes and divisions.

Enterprise integration with e-business is about the end-to-end integration of an organization's people, processes, and technology. This includes intra-enterprise integration and inter-enterprise integration. Intra-enterprise integration has typically been known as enterprise application integration (EAI). "EAI is primarily about integrating custom and package applications to drive operational efficiency within the corporation. Whereas inter-enterprise integration reaches beyond the enterprise to link information from two or more entities." [2] In addition to the efficiencies gained by EAI, it also provides effectiveness through its ability to integrate otherwise disparate systems. Note that intra-business (i.e., business activity within a business, likely using an internal network) consists of internal transactions so there may not be a true payment process. The payment process may consist of transfers of funds or charges against budget accounts in the form of accounting transactions for the intra-company billing procedure.

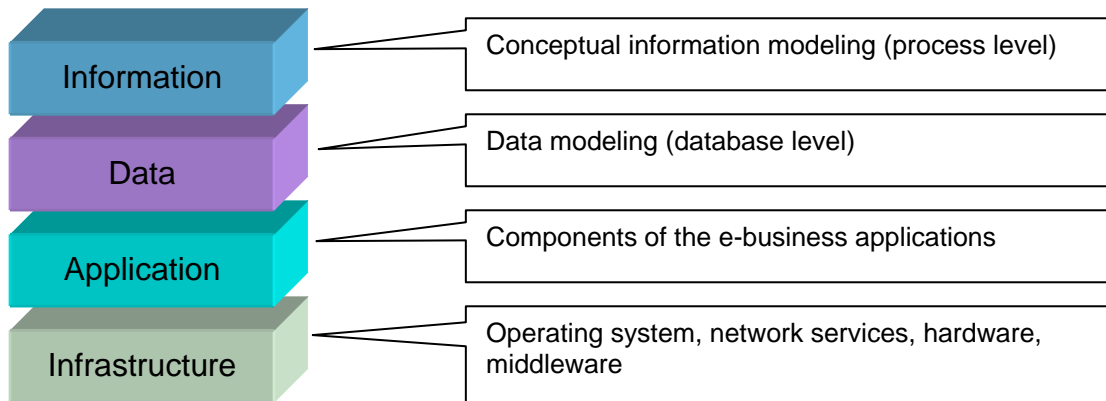
C. Technology Considerations

Technology considerations vary widely because of the diversity of the e-business models. However, it is important to have a baseline understanding of the e-business technology considerations because of their impact on enterprise integration. The main components to an e-business solution as displayed in **Figure 7** include information architecture, data architecture, application architecture, and infrastructure architecture. Defining the details of these technology considerations is largely a collaborative process performed with the business partners.

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Figure 7 - E-business Technology Components



The information architecture component defines conceptual information exchanged at the process level necessary to fulfill each of the business requirements for the e-business solution. The data architecture defines the data elements and metadata (i.e., data about data) at the database level that flows internally and externally. The application architecture defines the components or modules of the application that will manage the data defined in the data architecture. The infrastructure architecture defines areas such as the actual e-commerce applications, middleware (helps move data between disparate systems), operating systems, networking services, and hardware. E-Business requires compatibility between business partners at these levels to ensure integration.

The current e-business infrastructure market is experiencing heavy vendor competition for one-stop shop e-business solutions. **Appendix B** provides a summary of a Gartner analysis on the e-business infrastructure market, and how notable vendors are servicing it.

There are several e-business hosting models which enterprises may deploy. A hosting model describes where on the e-business support spectrum (internal vs. outsource) the solution lies. This support addresses how the infrastructure components (hardware, software, telecommunications) are managed, owned, and physically located. The three primary hosting models include: in-house software installation, external application hosting, managed service provider. Refer to **Appendix C** for more details on the e-business hosting models.

With the growing awareness of the importance of information security, it is widely known that Internet security is a crucial technology requirement for the success of e-business. The risks inherent in e-business can be mitigated only through appropriate security measures that ensure the integrity and reliability of electronic transactions. Security in e-business generally employs procedures such as authentication, confidentiality, access control, and encryption. Although further details on information security are outside the scope of this document, it is essential to understand that sound information security is a cornerstone for successful e-business.

D. Process Integration Considerations

Business Requirements

An essential step in planning an e-business initiative is identifying business requirements. The business requirements help define the information that will be exchanged between business partners. With the proliferation of technology, there has been a general push for access to information. For instance, when

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asked what kind of company Wal-Mart is, Sam Walton, CEO, responded to Fred Stein (co-author of *Network Centric Warfare*) "Those who think Wal-Mart is a retail company I will beat, those who think it is an information company I fear". However, the human-computer interaction component of this 'access to information' has lagged behind in advancement. A holistic view of business requirements is critical in the e-business environment because of the downstream affect of e-business activity. For example, imagine a soldier attempting to order additional repair parts and bullets. The first problem is if the soldier has to log-on to two systems to find inventory levels for repair parts and bullets. Then imagine if the requestor has to log-on to two more systems to submit a supply request. A business requirement that appropriately considers the soldier may be to have an integrated front-end for supply ordering to streamline the process. With the Army's focus to produce operational results for the warfighter, e-business initiatives must optimize the human-computer interaction from foxhole to factory.

When e-business is implemented appropriately, it promotes collaboration. A business requirement to enable this collaboration is the bi-directional flow of information. This must include knowledge exchange between the warfighter who defines the requirements, the 'laboratory' that develops the concept, and the manufacturer who develops the product. Bi-directional and continuous information flow allows the warfighter to sustain and support combat capabilities for testing and ongoing usage.

Financial Considerations & Costs

As e-business continues to mature, its financial benefits will become more evident. Many transaction costs are approaching zero with the use of the Internet. People around the world can now quickly and economically access the information they need almost instantly. For instance, a soldier located anywhere in the world can now easily access DoD EMALL via the Internet and obtain delivery information for a supply order. Prior to implementing EMALL, DoD's electronic ordering system, "DoD estimated that each paper-based purchase cost the department about \$140 per transaction. Purchases made using a Government purchase card helped reduce costs to about \$25 per transaction. EMALL has gone much further. Purchases made through EMALL cost just \$11 per transaction." [8]

E-business solutions, by definition, involve extensive integration with partners. As a result, more functionality is required from e-business solutions, which in turn increases the cost of implementing the integration. Strategy, planning and analysis should help ensure that the costs to integrate are offset by future transaction cost savings and process streamlining.

Integration with Other Business Processes

As mentioned earlier, the President's Management Agenda states that expanded electronic government is a priority to secure greater services at lower costs. A key component the Agenda outlines is integration with other business processes, other agencies, and other levels of government. As documented in the Agenda, "Many agencies do not take care to ensure that their IT systems can communicate with one another. The Department of Veterans Affairs (VA), for example, built a new online form for veterans in one office and then discovered they had to print out the information and mail it to another office of VA because the two systems were not interoperable." [1]

In an ideal scenario there is a seamless integration of back-end systems with front-end systems to reduce costs of data duplication and allow real-time updates of data across systems. When speaking in e-business terms, the front-end systems of an e-business initiative interact directly with business partners, whereas the back-end systems relate to the hardware, software, and processes that handle areas such as finance, logistics, inventory management, human resources. The desire for different functional areas to share information instantly has led to the popularity of enterprise resource planning (ERP) systems. ERP systems link individual applications/processes (for example, accounting and inventory) into a single application that integrates the data and business processes of an enterprise. Then taking the integration concept a step further, *B2B Integration (B2Bi)* takes the typical B2B model to the next level of enterprise integration. Instead of simply automating a transaction, B2B integration automates a whole business

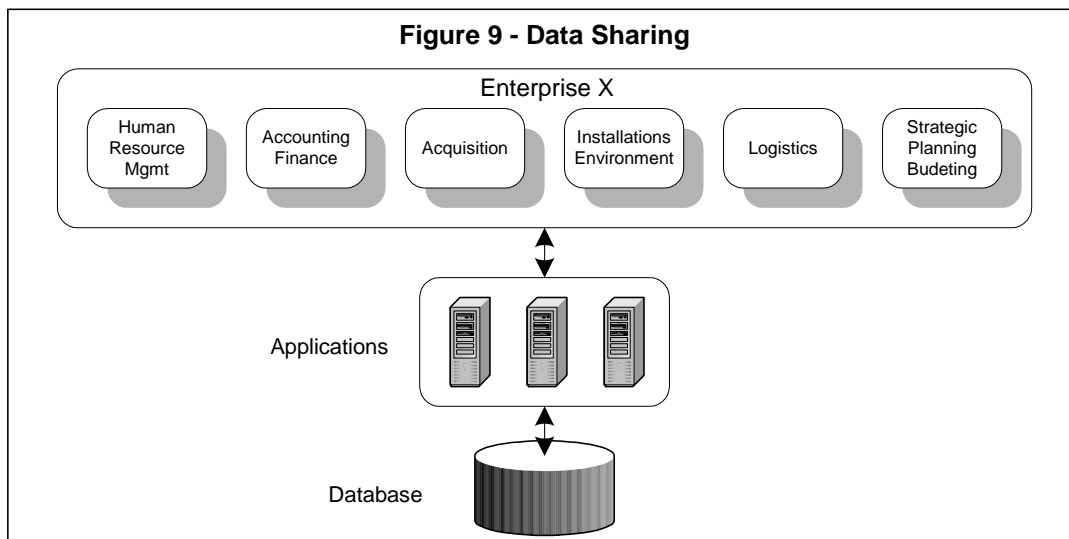
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channel, end-to-end. This entails not only the front-office systems of business partners' interacting, but also the back-office systems. Coordinating these integration efforts is aided with an architecture framework such as DoDAF (DoD Architecture Framework).

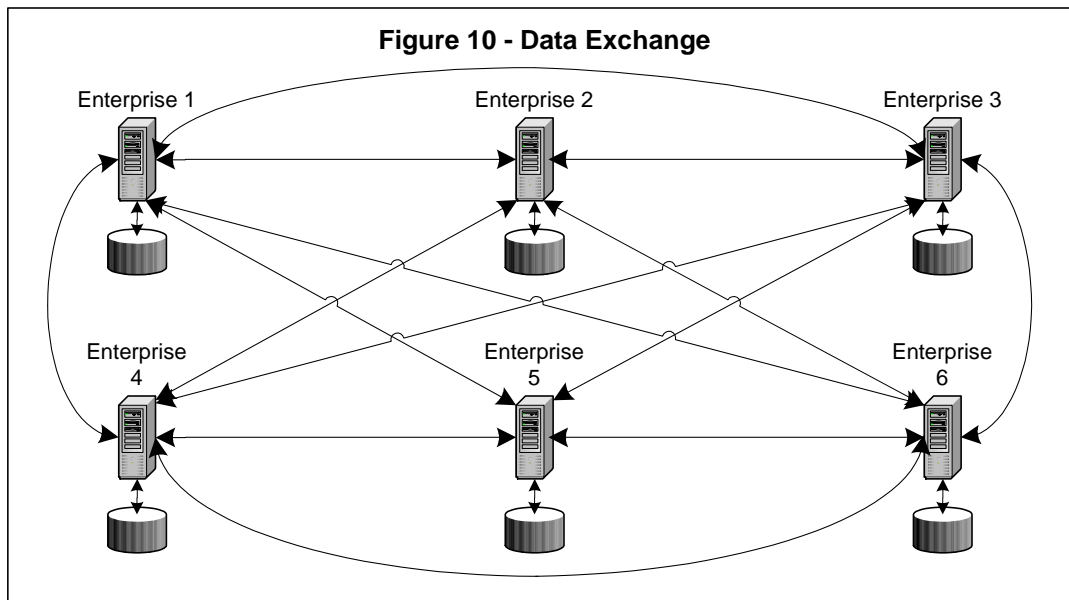
E. Integrated Enterprises

The boundaries between organizations are blurred, which causes difficulty in defining an enterprise. The e-business concept of one enterprise exchanging data with one or more disparate enterprises (inter-enterprise) is a relatively mature concept. However, the development of approaches to apply e-business concepts to internal business interactions within large enterprises (e.g., federal government) (intra-enterprise) is still in its infancy. For example, should an e-business approach be used when the Logistics domain of the Army transacts with the Accounting & Finance domain of the Army, or when a Department of Defense branch transacts another federal government entity such as the Social Security Administration. Proper analysis of the relationships in terms of enterprises must be performed. When data is transmitted within the enterprise, ideally it follows a data sharing model instead of a data exchange model. This takes advantage of the ownership of data within the enterprise. Whereas a data exchange model should be used when data is interacted between enterprises. See **Figure 9** for a graphical depiction of data sharing where all domains of an enterprise (Enterprise X) are supported by a centralized set of applications and databases and **Figure 10** for a graphical depiction of data exchanging where each enterprise (Enterprise 1 – 6) is supported by its own silo of applications and databases.



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Characteristics for the two scenarios of data sharing and data exchanging are distinctly different, see **Figure 8** [9].

Figure 8 - Sharing Data vs. Exchanging Data

Sharing Data	Exchanging Data
<ul style="list-style-type: none">• Internal interfaces• Passing data AND business process logic• Enabled through technologies such as Enterprise Application Integration (EAI) (e.g., SAP's NetWeaver product)• Less strict security requirement because data is only accessed internally	<ul style="list-style-type: none">• External B2B-like connectivity• Passing just data• Enabled through EDI (Electronic Data Interchange) and Internet standards such as XML (Extensible Markup Language)• Requires advanced security because data can be accessed externally

The architecture used to share data is more apt to involve a data warehouse, which is a logically consolidated store of data drawn from one or more sources. Although not traditionally done, data warehouses are beginning to support data exchanges with “feedback loops of content from the data warehouse back to source transactional systems; and other complex cross-system interactions.” [5]

F. E-business Guidance & Recommendations

While e-business is a solution that has been widely deployed over recent years, there hasn't been clear and concise guidance for e-business best practices. Listed below are guidance and recommendations that apply to the various e-business models:

- E-business brings about a concept to adopt technology, not just transfer to it
- E-business initiatives should be evolutionary, not overnight changes
- Avoid straying from sound business strategy

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- Systems don't define jobs, jobs define systems
- Consider on-going support requirements from the outset

For more details regarding these recommendations, refer to **Appendix D**.

G. In Summary

Although e-business is generally considered a solution based on technology, it is actually a solution based on people, processes, and technology. This document conveys the significance of defining the enterprise and its boundaries first in order to lay the foundation for end-to-end integration. Once the enterprise has been defined, e-business solutions designed for internal or external integration can be deployed. Where internal integration is facilitated by *sharing* information within an enterprise, external integration is deployed by *exchanging* information between enterprises. Through involvement of all stakeholders, e-business can provide reduced costs and improved operational efficiencies.

Appendix A – Glossary of Terms

Note: There are 3 sections to this glossary.

Foundation Terms:

Enterprise. Organizational entity of any size (especially large organizations) that uses information networks to interact with employees, vendors or customers.

Enterprise Integration. The vertical and horizontal alignment of plans, business processes, and information systems across organizations and functional boundaries to provide competitive advantage. [10]

E-Commerce. The execution of business transactions over computer networks. A process of buying and selling products, services, and information over computer networks. [11] This typically has a narrower definition than e-business, although some use the terms interchangeably.

E-business. Extends the concept of e-commerce to include collaborative business processes among business partners linked by a strategic vision. [3] Includes intra-business, inter-organizational information system, and collaborative e-commerce. [11]

E-business Model. The method in which an e-business generates revenues: for example, by selling directly to consumers, to other businesses, or to government agencies or e-business Web sites that bring multiple buyers and sellers together in a virtual centralized marketplace. Models can include B2B, B2C, G2C, etc.

E-business Models:

B2B (business-to-business). E-business model where the buyers and sellers are businesses. There are several sub-models for B2B based on who controls the marketplace: buyer-oriented B2B, seller-oriented B2B, or intermediary-oriented B2B. [11]

B2C (business-to-consumer). E-business model where consumers access a merchant's Web site for the purpose of buying a product or requesting a service. [4]

B2G (business-to-government). E-business model where governments purchase products and services from vendors. [11]

C2B (consumer-to-business). E-business model where consumers use the Internet to sell products or services to businesses or individuals seek sellers to bid on products or services they need (e.g. priceline.com). [11] The key concept is that the consumer determines the price, whereas with B2C the business determines the price.

C2C (consumer-to-consumer). E-business model where individuals use the Internet and Web technologies to sell to other individuals. [12]

G2B (government-to-business). E-business model in which the government provides businesses with services. "The intent is to make it easier for businesses, especially small businesses, to interact online seamlessly with all levels of government." [8] For example, state governments are deploying business services portals for business registration and licensing.

G2C (government-to-citizen). E-business model in which the government provides services to citizens electronically through a centralized Web location/portal (e.g. forms, payments). [11]

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G2G (government-to-government). E-business model within or between government units. [11] However, some would argue that G2G is only activity between government units, not activity within government units. “The primary goal is to enable federal, state, and local governments to more easily work together to better serve citizens within key lines of business.” [6]

A2A (application-to-application). E-business model applying intra-business e-commerce with transactions interfacing between applications within an enterprise. [13] Note that in B2B Integration (i.e. B2Bi instead of B2B), A2A focuses on the integration of applications of two different enterprises instead of the same enterprise.

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B2B Exchange. A many-to-many marketplace (e-marketplace). Some contend that an exchange must exhibit dynamic pricing, such as auctions. The Covisint auto parts exchange is an example of a B2B exchange where multiple parts suppliers are integrated with multiple auto manufacturers. eBay is a consumer version of a B2B exchange.

Collaborative E-Commerce (c-commerce). (1) Electronic collaboration between buyers and sellers, usually along the supply chain. (2) Activities that take place between partners in an exchange. [11]

Corporate Portal. A personalized, single point of access through a Web browser to critical business information located inside and outside of an organization. A portal is a gateway and a corporate portal is a gateway to corporate information. [11] Also known as enterprise information portals (EIP).

Extranet. A secure network that uses Internet and Web technology to connect two or more intranets of business partners, enabling business-to-business communications. [12]

Intranet. A network that uses Internet technologies (i.e. TCP/IP, HTTP, FTP, HTML, and XML) to allow employees to view and use internal Web sites that are not accessible to the outside world. These internal Web sites can support e-commerce activities such as sales, customer service, procurement, and so forth.

Interface. Mechanism by which a component describes what it does and provides access to its services. Important because it represents the “contract” between the supplier of services and the consumer of the services. [14]

Intra-enterprise E-business. Application of e-commerce methods within an enterprise, usually on its Intranet, with the goal of creating a paperless environment. Activities range from providing internal customer service to selling products to employees. Can be done between:

- A business and its employees (B2E)
- Among units within the business (c-commerce (see definition above))
- Among employees in the same business (c-commerce) [11]

Inter-organizational Information System (IOS). A communications system that allows information flow between two (or more) business partners. [11]

Marketplace. (Electronic marketplace) An electronic arena for buying and selling products and services.

Partner Relationship Management (PRM). A business strategy that enables enterprises to manage and foster profitable business partner relationships through the use of technology.

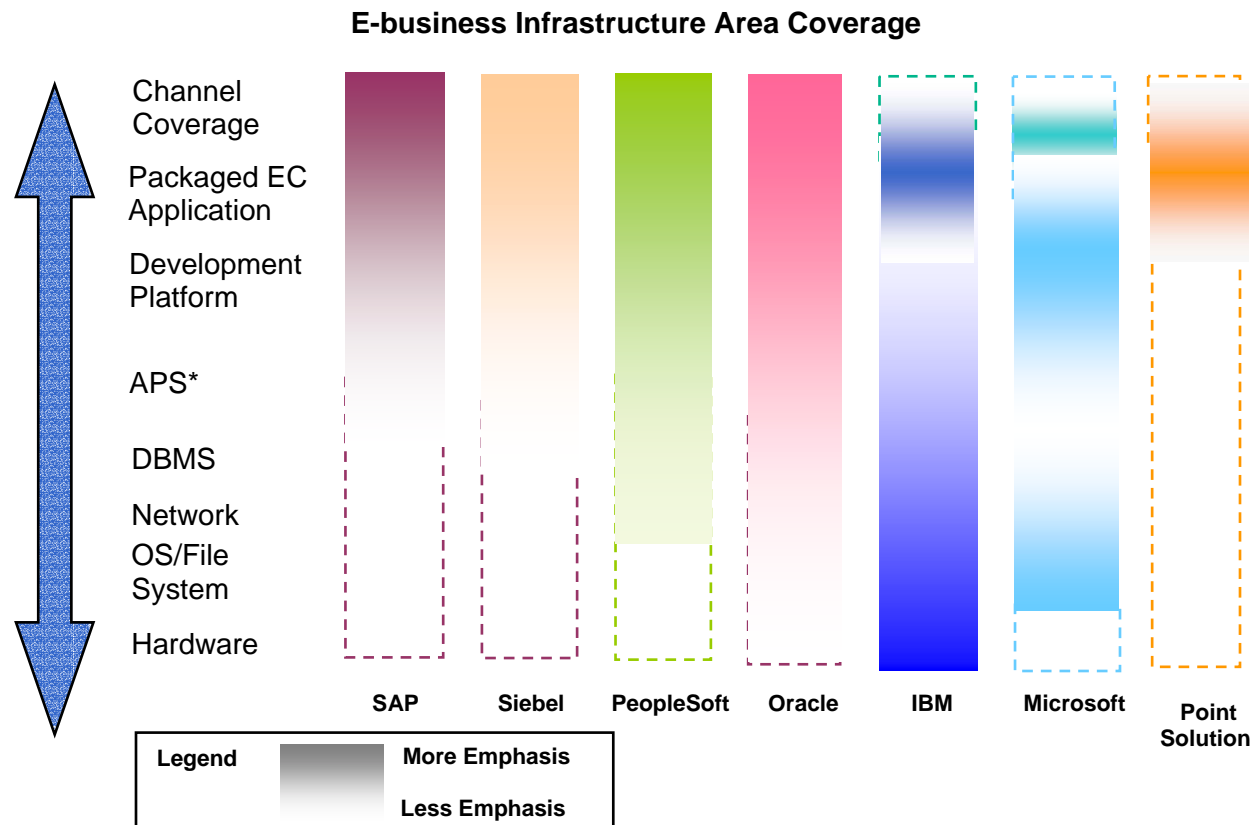
Web Service. The technologies involved in exchanging data between different applications and systems over an IP (Internet Protocol) network.

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Appendix B – Gartner Analysis on E-business Infrastructure

Vendors are seeking to fulfill the spectrum of an enterprise's e-business technology requirements, from hardware to packaged applications, to help ensure compatibility of the technology deployed. However, this does provide a risk of reliance on a single vendor and not only lock an enterprise in to the products provided, but also the architectural direction of the vendor. Gartner performed an analysis of e-business vendors and charted the solutions they provide for each of the infrastructure areas. Gartner's diagram [3] (**see below**) is included in this document to provide an overview of the infrastructure areas and show an example of how vendors can support the infrastructure areas, to give an opinion on a vendor's market coverage.



*APS - Application Platform Suite (app server, virtual machine, integration broker, message service, security)

Appendix C – E-business Hosting Models

Listed below are the most widely deployed e-business hosting models. Although typical implementation scenarios are listed for the models, ultimately the model selection should be based on collaboration with business partners and consideration of the enterprise's core competencies.

- **In-house Software Installation** – The enterprise manages all of the components (software, hardware, infrastructure) associated with interactions directly with the business partner. This model should be considered only when there are internal IT people skills (and funding for on-going training), hardware and infrastructure availability, or there is a need for tight integration with multiple enterprise applications.
- **External Application Hosting** – A vendor provides the infrastructure but the enterprise manages the e-business activity. This model should be considered when there are limited internal IT people skills or limited hardware and infrastructure availability. Examples of support vendors include Channelwave, Click Commerce, IBM, and Comergent.
- **Managed Service Provider** – The vendor not only hosts the software but also handles fulfillment and distribution for the enterprise. This model should be considered when the enterprise lacks core competency in business processes for e-commerce but has an imminent need for it. This option does not have a noteworthy market share.

Appendix D - E-business Guidance & Recommendations

Technology Adoption vs. Technology Transfer

E-business brings about a cultural change in the use of technology that requires its adoption as opposed to simply transferring to the new technology. The cultural change is a shift (i.e., exploit and adopt) to integrated enterprise units, both internally and externally. "When faced with actual time, resource, and skill limitations, most organizations default to technology transfer, i.e., "Just get the thing into people's hands, and they will use it." However, adopting a technology is more than a technical issue. It presents technical, social, behavioral, managerial, and organizational barriers." [15]

Evolutionary Change vs. Overnight

Evolutionary change is generally easier to adopt than abrupt overnight changes. The evolutionary change concept integrates well with the incremental approach to system development.

Use Sound Business Strategy

Base the e-business service definition on a sound understanding of the targeted business partner segments, relationships and needs. Select an application that the applicable community feels would provide significant burden reduction. Ensure continuous buy-in from all the stakeholders. Achieve interagency and intergovernmental cooperation and collaboration. Reach out to agencies and enterprises to ensure effective dialogue and sharing of information and ideas. Recognize the efficiencies involved in collaborating with those who may have already addressed important issues.

Develop a business architecture that best exploits a repeatable framework and promotes growth and sustainability of the desired capability. Develop interoperability and architectural standards to ensure that all parties can continue to communicate successfully beyond the first release. Further, a transaction engine including forms processing, business rule engine, payment processing, ensured message dissemination and workflow must perform multiple functions.

Job Definition

Should jobs, defined as the set of tasks and responsibilities an individual is required to conduct, be defined based on a system's design? The answer is no, systems don't define jobs, instead jobs define systems. Ideally, jobs are defined by business processes, which are defined by strategy. Another way to view it is that the order of consideration should be people, process, then technology, not technology, process, then people. A situation to avoid is implementing e-business capabilities without appropriately considering affected job roles. Along the same thought pattern, business drives technology, not the opposite.³

³ Paul L. Derby, Principal Enterprise Consultant, Binary Consulting Inc., supporting Army Architecture Integration Cell, Army Business Enterprise Team, CIO/G6, personal interview, 8 July 2004.

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Consider On-going Support Requirements

On-going support considerations are generally not given enough analysis during the planning phase of a system implementation. However, there are several technical considerations that may cause a long term negative effect on e-business success if they are not sufficiently considered:

Embrace Standards – E-business standards are developed to ensure ease of connectivity between business partners. By embracing standards there is a greater chance that future e-business partners will be able to integrate easily. However, proprietary technology is a negative driving force for standardization and integration, further promoting vendor-based technology instead of industry-based technology.⁴

System Retirement Planning – It is not uncommon for an enterprise to forego upgrading to a desired system simply because there are too many inter-dependencies on the legacy system. Planning for system retirement during the planning phase of a system implementation can provide great flexibility in the long-term.

Loose Coupling – One technology or product's dependence on another describes the coupling effect. A looser coupling allows greater flexibility in the future for modifications and enhancements.⁴ For instance, using the Microsoft .Net Web service architecture requires a set of technology including XML and SOAP together. However, if another standard replaces SOAP, the enterprise may not be able to transition to the new technology easily because its XML code is so closely tied to SOAP.

⁴ Paul L. Derby, Principal Enterprise Consultant, Binary Consulting Inc., supporting Army Architecture Integration Cell, Army Business Enterprise Team, CIO/G6, personal interview, 8 July 2004.

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Appendix E - References

The following references are **not** in alphabetical order. They are in the order they appear in the document.

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